

On the specimens of *Phascologale* in the Museo Civico, Genoa, with notes on the allied species of the genus; by OLDFIELD THOMAS, British Natural History Museum.

Being engaged in working out the species of the difficult Marsupial genus *Phascologale*, I have, by the kindness and generosity of the Marquis G. Doria, been entrusted with the whole of the valuable collection of specimens of the genus contained in the Museo Civico, Genoa. This collection comprises not only the types of the species described by the late Prof. Peters in conjunction with the Marquis Doria, but also a considerable number of additional specimens belonging to these and other rare Papuan species, species either almost or wholly unrepresented in any of the other great European Museums.

By the help of this collection and the comparison of the specimens in the Leyden, Paris and British Museums, I have been able to draw up the following notes on the chief species of the genus *Phascologale*.

Before commencing I have much pleasure in returning my sincere thanks for the courtesy and liberality with which, during my examination of specimens, I have been treated by the Directors of the continental Museums I have visited, and especially by D.^r F. A. Jentink, Prof. A. Milne Edwards, D.^r R. Gestro and by the Marquis G. Doria himself.

With regard to the limits and position of the genus *Phascologale* it is evident, on the examination of the very various forms more recently discovered, that *Antechinus*, Macl., *Myoictis*, Gray,

and *Chaetocercus*, Kreffit (*Dasyercus*, Peters), cannot stand as distinct from it, their distinguishing characters, both cranial and external, being led up to or possessed by the different species in different degrees (¹). On the other hand *Sminthopsis*, Thos. (²), and *Antechinomys*, Kreffit, differ from *Phascologale* by such marked external characters that, although their skulls and teeth are in no way generically distinguishable from those of that genus, they should unquestionably be retained as distinct.

The greater part of the species are here noticed, but some of the smaller and obscurer ones have been so badly described that I have not as yet been able to make them properly out. These, however, belong exclusively to the group *Antechinus*, all those of the restricted *Phascologale* of the older authors being therefore included.

The most important point in the description of the teeth has been found in the very remarkable series of gradations in the development of the last premolar, or pm ⁴ of the typical mammalian series, and for convenience of description I propose to use the following scale: when the tooth is as large as or larger than pm ³ it is called of the size 3, when about the size of or slightly smaller than the anterior premolar it is called 2, and when quite minute 1. Thus in the common species *Ph. penicillata* it is of the size 3 above and 2 below, or $\frac{3}{2}$, while in *Ph. apicalis* it is minute both above and below, or $\frac{1}{1}$.

The measurements of all the species are placed together on p. 511. Those only however, which are taken from spirit specimens can be trusted other than approximately. In the descriptions of the species also the combined lengths of the first three molars is recorded, this being apparently by far the most important measurement for descriptive purposes and its range

(¹) When Mr. E. R. Alston wrote his excellent paper on *Antechinomys* (P. Z. S. 1880, p. 460) such synthetic species as *Phasc. dorsalis*, *doriae*, *apicalis* or *virginiae* were either not known at all or had not had their dentition properly described.

(²) From σμίνθος, a mouse, and ἔφης, appearance. New name for *Podabrus*, Gould, 1845, nec (Fisch. de Waldh.) Westwood, Introd. Ins. II. Synops. p. 27, 1840 (*Telephoridae*).

of variation being therefore a necessary part of the description of the species.

1. **Ph. penicillata**, SHAW.

Didelphis penicillata, Shaw. Gen. Zool. 1. pt. 2 p. 502 pl. CXIII, 1800.

Size large. Ears very large, thin. Tail longer than head and body, short-haired for its proximal, evenly bushy all round for its terminal half. Hind-foot with the hallucal foot pad very long, continuous; and with a small supplementary pad behind the postero-external pad.

Head, body, limbs and proximal half of tail uniform grey: an indistinct darker stripe along the upper side of the muzzle. Bushy part of tail black.

Skull large and strong. Nasals but slightly expanded behind, their greatest barely double their least width.

Pm⁴ large above, medium below, i. e. $\frac{3}{2}$.

Milk premolar (M. Pm⁴) present above and below. I² considerably larger and stouter than i³ or i⁴, which are of the same size.

Molars ¹⁻³ ranging from 8.9 to 9.8 mm.

Hab. All Australia except the extreme north; not found in Tasmania.

2. **Ph. calura**, GOULD.

P. Z. S. 1844, p. 104.

Size medium. Ears very large, leafy. Tail longer than the head and body, its proximal half short-haired, terminal half with longer hairs. Hind-foot with the hallucal foot-pad very long, continuous.

Head, body and limbs grey. Hairs on inside of ears and on basal half of tail above and laterally, and on basal fourth below, rich red. Distal half of tail black.

Nasals slightly broader behind than in front, their greatest not double than least breadth.

Pm.⁴ large above, medium below, i. e. $\frac{3}{2}$. Ms ¹⁻³ about 6.5 mm. I² slightly larger than i³ and i⁴, which are about equal.

Hab. South and Western Australia.

3. *Ph. thorbeckiana*, SCHL.

Ph. melas (1), Schl. and Müll. Verh. Nat. Ges. Ned. p. 149, pl. XXV, 1839-44.

Ph. thorbeckiana, Schl. Ned. Tijdsch. Dierk. III, p. 257. 1866.

Chaetocercus Bruijnii, Peters, Ann. Mus. Civ. Genov. VII, p. 420, 1875.

Size large. Ears small, thick and fleshy. Tail at base bushy above and on the sides, evenly tapering to the tip; short-haired below. Hind-foot with the hallucal foot-pad continuous, or only indistinctly divided in the centre. Mammae 6.

Head dark yellowish rufous, the central stripe well marked. Back and sides of neck, and fore-limbs rich chestnut-red; rump and tail similar but darker, the extreme tip of the latter black. Back grizzled grey with three longitudinal black stripes, the external ones faint and often invisible; anterior back between the stripes generally white or pale yellow.

Skull strongly and heavily built. Nasals much expanded behind, their greatest breadth double or more than double their least.

Pm $\frac{4}{0 \text{ or } 1}$ medium above, minute or absent below, i. e. $\frac{2}{0 \text{ or } 1}$. I² and i³ about equal, slightly smaller than i⁴. Molars large, ms $\frac{1-3}{4}$ about 10 mm.

Hab. N. W. New Guinea.

a. ad. al. ♀. Salawatti. Bruijn.

b. ad. sk. ♂. Andai. Bruijn. Type of *Ch. Bruijnii*, Peters.

c. ad. al. ♂. Andai. Beccari.

d. ad. al. ♂. Ansus. Jobi I. Beccari.

An examination of the type of *Ph. melas* in the Leyden Museum proves that it is certainly specifically identical with *Ph. thorbeckiana*, the difference of colour being merely due to melanism.

4. *Ph. wallacei*, GR.

Mycictis wallacei, Gr. P. Z. S. 1853, p. 112, pl. LXIV.

Ph. pilicaudata, Pet. et Dor. Ann. Mus. Civ. Genov. XVI, p. 668, 1881.

Size large. Tail evenly tapering, very bushy above and on the sides, shorter haired below. Hind-foot with the long postero-

(1) This name, founded on a melanism, being misleading, I consider myself justified in using the later name of the same author.

internal hallucal foot-pad broadly divided in the centre into two. Mammæ 6.

Head pale yellowish rufous, central stripe scarcely visible. A patch behind ears clear pale red. Back of neck grizzled reddish grey, the central dark band becoming well defined. Back grizzled grey, with three black longitudinal bands. Rump, outer side of hind limbs and tail dark rich chestnut-red, much darker than that behind the ears.

Nasals slightly expanded behind, their greatest barely double their least breadth.

Pm ⁴ medium or large above, medium below, i. e. $\frac{2 \text{ or } 3}{2}$.

Ms ¹⁻³ about 9.0 or 9.5 mm.

Lateral incisors flattened, about equal in size.

Hab. S. New Guinea (Fly River district). Aru Islands.

a. ad. al. ♀. Fly Riv. L. M. D'Albertis. Type of *Ph. pilicaudata*.

b. ad. al. ♂. Katau, L. M. D'Albertis.

5. **Ph. dorsalis**, PET. et DOR.

Ann. Mus. Civ. Genov. VIII, p. 353, 1876.

Size medium. Ears small. Tail thin, short-haired throughout except just at base; the hairs on upper no longer than those on lower side. Hind-foot with the hallucal foot-pad divided in the centre. Mammæ 4.

Top of head and back coarsely grizzled grey, the hairs comparatively coarse, their tips pale yellow or white. One well-defined dorsal stripe running from muzzle to rump. Back of ears, arms, legs, base of tail and whole underside from chin to anus rich chestnut red. Tail, except just at the base, uniformly black all round, its terminal half-inch sometimes white.

Skull light and slenderly built. Greatest breadth of nasals about $2 \frac{1}{2}$ times their least breadth.

Pm ⁴ medium above, small but distinct below, i. e. $\frac{2}{1}$.

Molars small, ms ¹⁻³ about 7.5 mm. I² and i³ about equal, slightly smaller than i⁴.

Hab. N. W. New Guinea.

a. b. ad. al. ♂ ♀. Hatam, Arfak Mts. $\frac{6}{15}$. O. Beccari. *Co-types* of species.

6. *Ph. doriae*, THOS.

Ann. Mus. Civ. Genov. 2 Ser. IV, p. 203. 1886.

Size medium. Ears small, opaque. Tail about as long as the head and body, short haired throughout, except that for the basal third the hairs are slightly elongated along the upper side. Hind-foot with the hallucal foot-pad divided into two. Mammæ 4.

Top of head and back dark coarsely grizzled orange-brown, the tips of the hairs orange, general effect not unlike that of *Arvicola amphibius*. A median black stripe on the back as in *Ph. dorsalis*, but not running so far forwards on the head. Under side dull orange-grey, the tips of the hairs dark yellow; the difference between the upper and under sides not so prominent as in *Ph. dorsalis*. Tail coloured at base like body, for its middle four-fifths black all round, its extreme tip white.

Skull long and slender. Nasals evenly expanded behind, their greatest slightly more than double their least width. Interorbital space broad and smooth, its edges not ridged. Anterior palatine foramina extending backwards only to the level of the front edge of the canines. A single posterior palatal vacuity opposite m^2 .

Teeth comparatively large and heavy. Pm^4 about as large as pm^3 both above and below, i. e. $\frac{3}{3}$, its milk predecessor present, but quite minute and functionless.

Three lateral incisors each slightly broader than the one preceding it. Molars large, ms^{1-3} 9.0 mm.

a. ad. al. ♀. Mount Arfak. O. Beccari.

b, imm. sk. ♀. Mori, Mt. Arfak. 13. 8. 75. O. Beccari.

Co-types of species.

7. *Ph. virginiae*, TARRAGON.

Rev. Zool. 1847, p. 177.

Figured by Collett, P. Z. S. 1836, pl. LX.

Size medium. Ears large and thin. Tail about as long as head and body, cylindrical, short-haired, except at base.

General colour uniform grizzled grey. Face with three distinct

black lines, one running along the top of the muzzle and the other two from the sides of the muzzle to the eyes. Intervals between lines, sides of face, and tufts at bases of both inner and outer margins of ears rufous. Chin, chest, belly, fore-limbs, hands, and feet pale yellowish rufous, the bases of the hairs grey. Tail brown above, dull yellowish grey below.

Skull short and strongly built. Nasals scarcely broader behind than in front. Interorbital space unusually narrow, and with rudimentary postorbital processes.

Pm⁴ very large, both above and below, twice the size of pm³ above, and distinctly larger than it below, i. e. $\frac{3}{3}$, this species being the only one in which pm⁴ exceeds pm³ below. Molars small, ms¹⁻³ 5.3 mm., lateral incisors slender, i⁴ slightly larger than i² or i³.

Hab. Central Queensland.

I have to thank D.^r R. Collett of the Christiania Museum for the opportunity of examining the specimen of this rare species figured by him in the Zoological Society's Proceedings. It was obtained in Central Queensland by D.^r Carl Lumholtz.

8. *Ph. apicalis*, GRAY.

Ann. Mag. N. H. IX, p. 518, 1842.

Size medium. Ears small, opaque. Tail considerably shorter than the head and body, tapering, rather short-haired, but the hairs along its upper surface forming an indistinct crest. Hallucal foot-pad indistinctly divided.

Whole body uniform pale grizzled grey, back tinged with rufous. Upper surface distinctly speckled with white. A white ring round the eyes. Belly, limbs and underside of tail pale grey, with a tinge of yellow; outer sides of fore-arm rufous. Upper side of tail like back, but becoming black distally.

Skull stout and strong. Nasals very little expanded behind, their greatest only about 1 $\frac{1}{2}$ times their least width.

Pm⁴. quite minute, above and below, i. e. $\frac{1}{1}$.

Molars small, ms $\frac{1-3}{1}$ 7.0-7.8 mm. Lateral incisors slender, about equal in size.

Hab. South and Western Australia.

9. *Ph. cristicaudata*, KREFFT.

Chaetocercus cristicauda, Krefft, P. Z. S. 1866, p. 435. pl. XXXVI.

Size medium. Tail thick, considerably shorter than head and body, short-haired, except on the upper side of the terminal half, where there is a well developed crest.

Head, body, limbs and tail uniform reddish or sandy brown; tail-crest black.

Pm⁴ minute above, absent below, i. e. $\frac{1}{0}$.

I only know this species from the original description. It is evidently very closely allied to *Ph. apicalis*, and is certainly neither entitled to generic separation, nor, as Mr. Alston thought, is it « allied to *Dasyurus* rather than to *Phascologale* (1) ».

It should also be noticed that the absence of the minute lower pm⁴ is possibly only due to immaturity, as a nearly full-grown specimen of *Ph. apicalis* in the British Museum collection has this tooth still below the gum, without there being any milk predecessor to it in the tooth-row, a state of things which may easily be the case in the type of *Ph. cristicaudata*.

Hab. South Australia.

10. *Ph. longicaudata*, SCHL.

Ned. Tijdschr. Dierk. III, p. 257. 1866.

Size medium. Tail longer than head and body, uniformly short-haired, like a rat's tail. Hallucal pad continuous.

Head, body and limbs uniform finely grizzled grey brown, posterior back with a rufous tinge very much as in *Ph. minima*. Chin, chest, and belly white. Tail uniform dark brown all round.

(1) P. Z. S. 1880, p. 460.

Skull strongly built, muzzle convex above. Nasals narrow, but slightly expanded behind, their greatest barely double their least breadth. Palate long and narrow.

Pm ⁴ unusually large and strong, much larger than pm ³ above, and as large as the anterior premolar below, i. e. $\frac{3}{2}$. Lateral incisors small and narrow, i ⁴ slightly the broadest. Molars of medium size, ms ¹⁻³ 7.5 mm.

Hab. Aru Island.

11. *Ph. minutissima*, GOULD.

Antechinus minutissimus and maculatus, Gould, P. Z. S. 1851, p. 284.

Size very small. Ears of medium size. Tail rather shorter than head and body, short-haired throughout. Hallucal foot-pad divided. Mammæ 8.

General colour and appearance almost precisely the same as those of *Mus musculus*. Head and body mouse-grey. Belly rather paler, chin white. Tail brown above, rather paler below. Feet pale brown.

Skull short and stoutly built. Interorbital space broad, its edges smoothly rounded. Nasals much expanded behind, their greatest $2\frac{1}{2}$ times their least width.

Teeth proportionally strong. Pm. ⁴ large above medium below, i. e. $\frac{3}{2}$. Lateral incisors cylindrical, equal. Molars ¹⁻³ 3.7 mm. Milk-premolar well-developed.

Gould's « *A. maculatus* » is founded on an abnormal partially albino specimen, now in the British Museum, and is unquestionably specifically identical with *Ph. minutissima*.

Hab. Central Southern Queensland.

Table of measurements.

<i>Species</i>	<i>Sex</i>	<i>Condition</i>	<i>Head and body</i>	<i>Tail</i>	<i>Hind-foot</i>	<i>Fore-arm and hand (above crown)</i>	<i>Ear</i>
1. <i>Ph. penicillata</i>	♂	Skin	(c) 240	225	41	—	24.0
2. <i>Ph. calura</i>	♂	In spirit	(c) 125	147	24	—	20.0
3. <i>Ph. thorbeckiana</i>	♂	In spirit	215	201	43	59	18.0
4. <i>Ph. wallacei</i>	♂	In spirit	185	168	39	55	12.0
5. <i>Ph. dorsalis</i>	♂	In spirit	167	149	26	42	14.0
6. <i>Ph. doriae</i>	♀	In spirit	152	152	32.5	46	10.0
7. <i>Ph. virginiae</i>	♂	Stuffed	125	125	22	33	13.0
8. <i>Ph. apicalis</i>	♂	In spirit (imm.)	111	89	23.5	34	8.8
9. <i>Ph. cristicaudata</i>	?	?	114	89	28	—	—
10. <i>Ph. longicaudata</i>	♂	Stuffed	146	172	24	(c) 42	(c) 9.0
11. <i>Ph. minutissima</i>	♂	In spirit	72	65	11.2	18.3	7.7